

GEORGIA INSTITUTE OF TECHNOLOGY  
OFFICE OF CONTRACT ADMINISTRATION  
SPONSORED PROJECT INITIATION

Date: March 7, 1980

Project Title: 95 GHz System Support

Project No: A-2600

Project Director: Mr. J. A. Scheer

Sponsor: General Electric Company; Utica, NY 13503

Agreement Period: From 2/25/80 Until 9/30/81  
~~5/24/80~~

Type Agreement: Purchase Order No. F12-7F-16825, dated 2/25/80 and Change Order No. 1,  
dated 2/27/80

Amount: \$24,624

Reports Required: Monthly Summary Narrative Reports

Sponsor Contact Person (s):

Technical Matters

Contractual Matters

(thru OCA)

Mr. Peter H. Wing, MD/606  
Senior Buyer-Subcontracts  
General Electric Company  
Aerospace Electronic Systems Dept.  
P. O. Box 247  
Utica, NY 13503  
315/797-1000, ext. 5221/5275  
TWX: 510-242-0277  
TLX: 315-797-1000, ext. 5580

Defense Priority Rating: DO-A7 under DMS Reg. 1

Assigned to: RAIL/RDD (School/Laboratory)

COPIES TO:

Project Director  
Division Chief (EES)  
School/Laboratory Director  
Dean/Director-EES  
Accounting Office  
Procurement Office  
Security Coordinator (OCA)  
✓ Reports Coordinator (OCA)

Library, Technical Reports Section  
EES Information Office  
EES Reports & Procedures  
Project File (OCA)  
Project Code (GTRI)  
Other \_\_\_\_\_

SPONSORED PROJECT TERMINATION SHEETDate 11/6/81

Project Title: 95 GHz System Support

Project No: A-2600

Project Director: Mr. J. A. Scheer

Sponsor: General Electric, Aerospace Electronic Systems Dept.

Effective Termination Date: 9/30/81Clearance of Accounting Charges: 9/30/81

Grant/Contract Closeout Actions Remaining:

- ☒ Final Invoice ~~and Closing Documents~~
- ☐ Final Fiscal Report
- ☒ Final Report of Inventions
- ☒ Govt. Property Inventory & Related Certificate
- ☐ Classified Material Certificate
- ☐ Other \_\_\_\_\_

Assigned to: RAIL/RDD (~~School~~ Laboratory)COPIES TO:

Administrative Coordinator  
Research Property Management  
Accounting  
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Research Security Services  
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Computer Input  
Project File  
Other \_\_\_\_\_



## ENGINEERING EXPERIMENT STATION

GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

20 May 1980

General Electric Company  
Aircraft Equipment Division  
831 Broad St.  
Utica, NY 13505

Attention: Mr. Peter H. Wing, M.D. 606

Subject: Monthly Contract Technical Status Report Nos. 1 and 2  
"95 GHz System Support," P.O. #F12-7F-16825  
Covering the Period 25 February Through 30 April 1980

Dear Sir:

During the reporting period, three trips were made to General Electric Company to support installation and test of the 95 GHz radar system.

During the week of 25 February, Jim Scheer was at G.E. for initial checkout and interface verification tests. Some interface incompatibilities were found, but these were minor and easily corrected.

During the week of 10 March, Jim Scheer and Pete Britt were at G.E. for further testing and evaluation of the radar system performance. At this time it was determined that the integrating sample and hold circuits experienced some transient problems with wide band signals, and a plan was developed to rework the circuits. The RF attenuator was calibrated during this trip. Also the structure of the RF unit was stiffened by adding additional mounting bolts.

During the week of 17 March Jim Scheer was at G.E. to reconfigure two of the integrating sample cards - the sum sampler and the early/late gate sampler. This redesign resulted in much better balance and linearity of the sampled output.

### Future Plans

No trips are planned for the near future. Personnel from Georgia Tech will be available for travel on an as-needed basis to support operation of the 95 GHz sensor. The period of time over which support is required is longer than originally planned, necessitating a need for a time extension on the contract. A request for this extension will be submitted soon.

Financial Status

Of the authorized funding level of \$24,624.00, the expenditures as of the end of April total \$8,928.03, leaving an unexpended balance of \$15,695.97.

Respectfully submitted,

/James A. Scheer  
Chief, Development Division  
RAIL

Approved:

J. L. Eaves  
Associate Director  
RAIL





# Georgia Institute of Technology

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

10 December 1980

General Electric Company  
Aircraft Equipment Division  
831 Broad Street  
Utica, NY 13505

Attn: Mr. Mike Weimer - M.D. 606

Subject: Monthly Contract Technical Status Reports No. 3,4,5,6,7,8, and 9  
"95 GHz System Support," P. O. #F12-7F-16825, Covering the Period  
1 May 1980 Through 30 November 1980

Dear Sir:

During the reporting period, no support was required in the field since the 95 GHz system was reportedly operating satisfactorily.

During part of July, and part of August, some technician level work was done on the digital radar excitation unit which is required to operate the radar system when it is not operated as part of the complete data acquisition system. This work was done to prepare for the apparent possibility that the radar would be sent back to Georgia Tech for modifications in the fall. When the apparent date for these modifications changed to January 1981, work was stopped on the excitation unit.

## Future Plans

Work is to continue on completion of the excitation unit to prepare for modification of the radar in February 1981. A planning session is scheduled for 10 December 1980 with Dick Thompson to develop a work statement for this effort.

## Financial Status

Of the authorized funding level of \$24,624.00, the expenditures as of the end of October were \$10,014.33 leaving a balance of \$14,609.67. The charges during July and August were primarily for the excitation unit work described above. It is expected that this is enough to fund completion of the excitation unit and provide support of the 95 GHz sensor in the field after modifications have been performed.

Contract Status

The termination date for the contract is 31 March 1981. It is expected that an additional no cost time extension is required to provide field support beyond that date. A final determination will be made during the 10 December planning meeting.

Respectfully submitted.

/ James A. Scheer  
Project Director

JAS/vcy

Approved:

J. L. Eaves  
Associate Director  
RAIL



# Georgia Institute of Technology

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

6 March 1981

General Electric Company  
Aircraft Equipment Division  
831 Broad St.  
Utica, NY 13505

Attn: Mr. Mike Weimer - MD 606

Subject: Monthly Contract Status Reports No. 10 and 11,  
"95 GHz System Support," P. O. #F12-7F-16825,  
Covering the Period 1 December 1980 through  
31 January 1981

Dear Sir:

On December 10, 1980, Dick Thompson, the project monitor from G.E. Utica visited to plan the additional tasks anticipated for the months of February and March 1981. He met with Pete Britt, Clark Butterworth, David Ladd and Jim Scheer who will be the key people associated with the new tasks at Georgia Tech. Dick brought a preliminary list of tasks to be performed on the radar.

Work was resumed on the radar excitation unit in December and January. The design is complete and fabrication is nearly complete. Some functions have been tested and are working and some wiring still needs to be done for final assembly.

Jim Scheer traveled to Hanscom AFB on January 19 through January 21 to install the IF attenuators in the receiver box. At that time some cursory tests were performed on the IF circuits.

## Future Plans

It is expected that the radar excitation unit will be completed in February, in anticipation of receipt of the radar. An estimate of the cost to complete the tasks required for the radar modification will be sent to General Electric when the task list has been finalized.

Financial Status

The amount remaining in the project as of the end of January 1981, is \$8,085.05. A detailed description of the nature of the expenditures over the last few months is attached.

Respectfully submitted,

/James A. Scheer

JAS/vcy

Approved:

J. L. Eaves  
Associate Director  
RAIL



# Georgia Institute of Technology

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

25 February 1981

## MEMORANDUM

To: Mike Weimer  
G. E. Co.  
Utica, NY 13503

From: J. A. Scheer

Subject: Breakdown of Expenses on P. O. # F12-7F-16825

This memo describes the breakdown of expenses on purchase order F12-7F-16825, including the months of September 1980 through January 1981. The status report for December and January are in preparation and will be sent under separate cover by 2 March 1981.

<u>Catagory</u>	Sept.	Oct.	Nov.	Dec.	Jan.
Engineering Services	0	0	0	807.94	115.56
Technician Services	0	0	0	951.00	1,043.20
Materials and Supplies	0.18	0	0	0	108.10
Travel Expenses	0	0	0	0	358.00
Employee Benefits	0	0	0	195.42	128.74
Overhead	0	0	0	1,284.03	845.89
TOTAL	0.18	0	0	3,238.39	2,599.49

JAS/vcy

cc: N. McHan

Georgia Institute of Technology  
ENGINEERING EXPERIMENT STATION  
ATLANTA, GEORGIA 30332

16 July 1981

Mr Mike Weimer  
General Electric Company  
831 Broad St.  
Utica, NY

Subject: Monthly Status and Financial Report for May 1981  
on P.O. F12-7F-16825 (GIT Project A2600)

Dear Sir:

This letter provides the breakdown of expenses which were incurred in May 1981 on the subject P.O. The work done during the period involved discussions with Mr. Paul Kingston (at MIT/LL) on the telephone and circuit evaluation. The materials costs are late billings associated with components purchased in March when the radar was at Georgia Tech for refurbishment.

Expense Breakdown

Catagory

Engineering Services	\$ 179.67
Materials and Supplies	688.20
Employee Benefits	19.96
Overhead	<u>131.16</u>
Total	\$ 1018.99

Sincerely,

/ James A. Scheer  
Project Director

JAS/vcy

Georgia Institute of Technology  
ENGINEERING EXPERIMENT STATION  
ATLANTA, GEORGIA 30332

1 September 1981

Mr. Mike Weimer  
General Electric Company  
831 Broad Street  
Utica, NY 13503

Subject: Monthly Contract Technical Status and Financial  
Report for June, July, and August 1981 on  
P. O. F12-7F-16825 (GIT Project A2600)

Dear Sir:

The three monthly reports are combined because of the lack of need for any engineering work during the reporting period.

No support was required on the radar system because very few flights were made during the summer period. Mr. Paul Kingston has been able to maintain the system without help from Georgia Tech.

The plans for September are to complete the final report and deliver it around 15 September 1981. It will include a description of the radar (primarily the timing and control card) and a description of the TCU emulate, with complete schematic diagrams. It is expected that the \$1,303.56 remaining in the project is sufficient for completing the effort.


Expense Breakdown

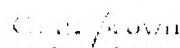
During the period, \$11.56 was expended on secretarial services and \$0.24 was expended for xerox reproduction, leaving a balance of \$1,303.56 as of the end of July 1981. No expenses were incurred in August.

Respectfully submitted,

James A. Scheer  
Project Director

JAS/vcy

Approved: 

  
Chief, Development Division  
RAIL

#12601

# Georgia Institute of Technology

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

12 October 1981

Mr. Mike Weimer  
General Electric Co.  
831 Broad St.  
Utica, NY 13503

Subject: Monthly Contract Technical Status Report No. 19 (Final)  
for September 1981 on P.O. F12-7F-16825 (GIT Project A2600)

Dear Sir:

This letter represents the final progress report on the subject purchase order. The attached drawings provide the technical information requested on the project, namely a complete schematic of the radar interface unit and a complete schematic of the TCU emulator. The TCU emulator was developed on this purchase order and the radar interface circuit, although originally produced on another purchase order, was modified on this order.

More complete information on the other parts of the radar development, namely the transmitter, RF unit, receiver, samplers, and antenna patterns will be submitted in a report to be published and distributed to you in November. The information in the present report is of more immediate interest and is therefore submitted now.

All work on the subject purchase order is now complete. The final billing, in the amount of \$1,303 represents engineering person power required to finalize the schematic diagrams in this report.

Respectfully submitted,

/James A. Scheer  
Project Director

JAS/vcy

Enclosures:

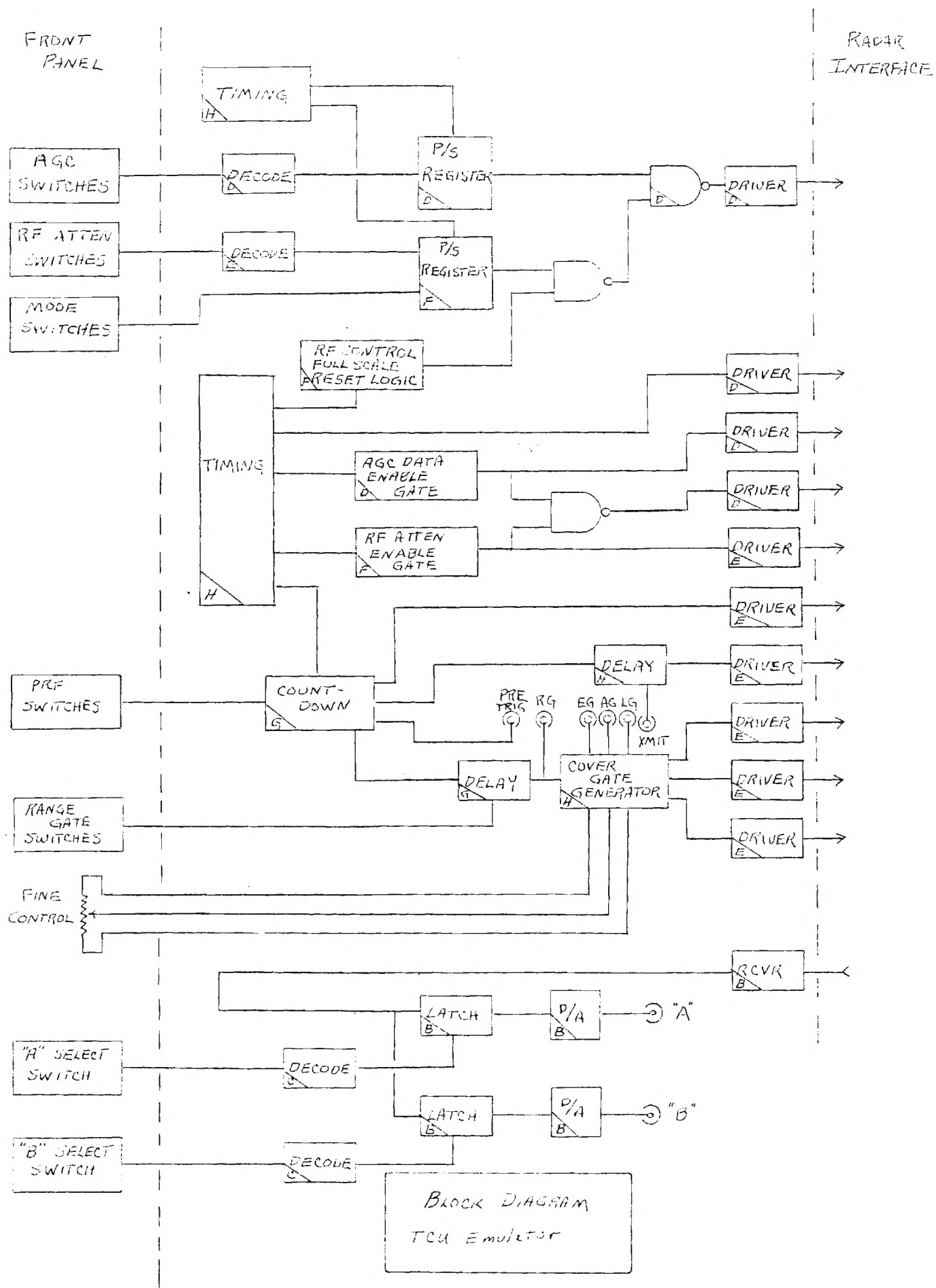
Approved:

Charles E. Brown  
Chief, Radar Development Division  
RAIL

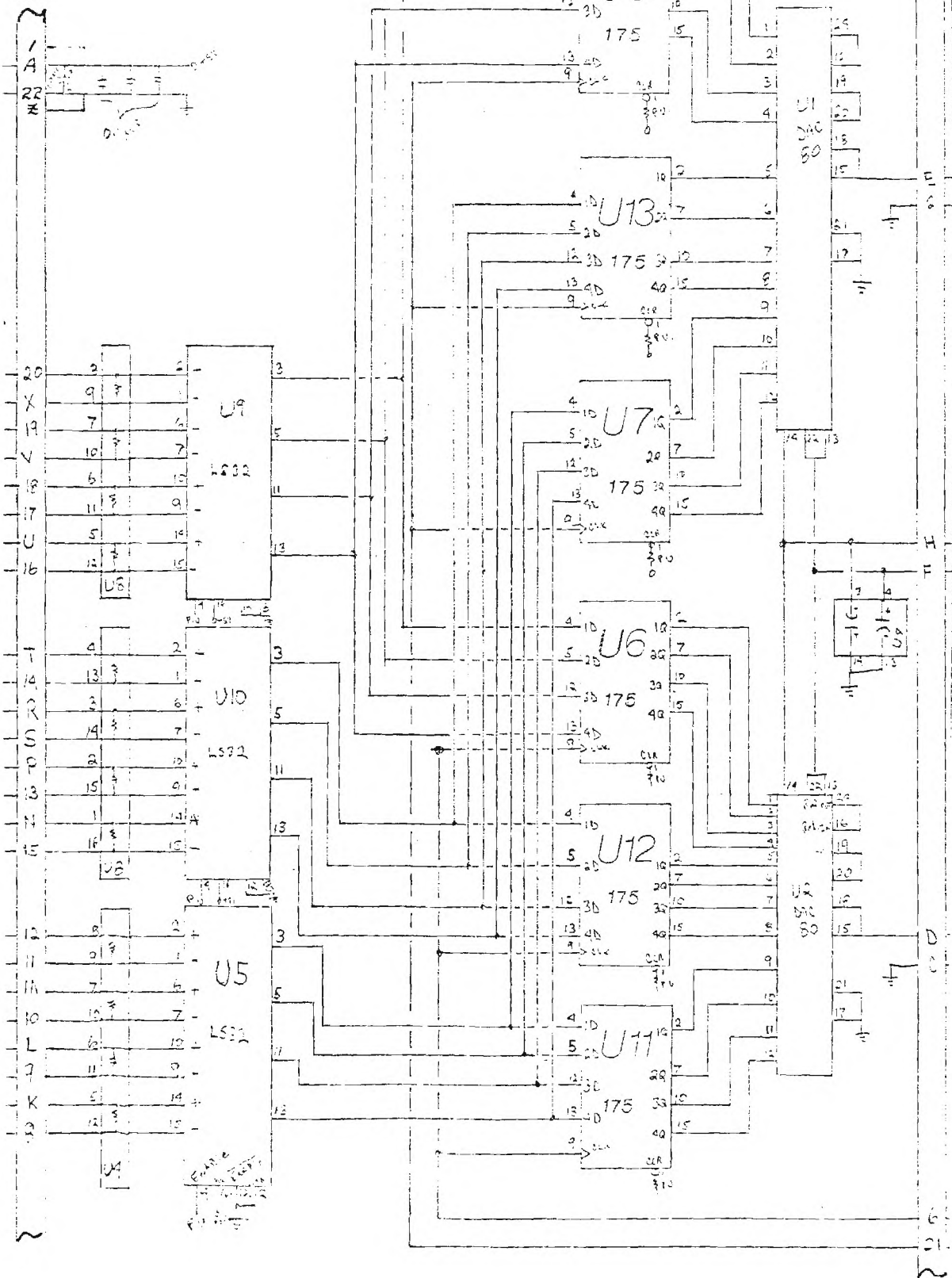


## Engineering Diagrams - TCU Emulator

- Block Diagram
- Board Schematics
- Running Lists
- Board Layouts

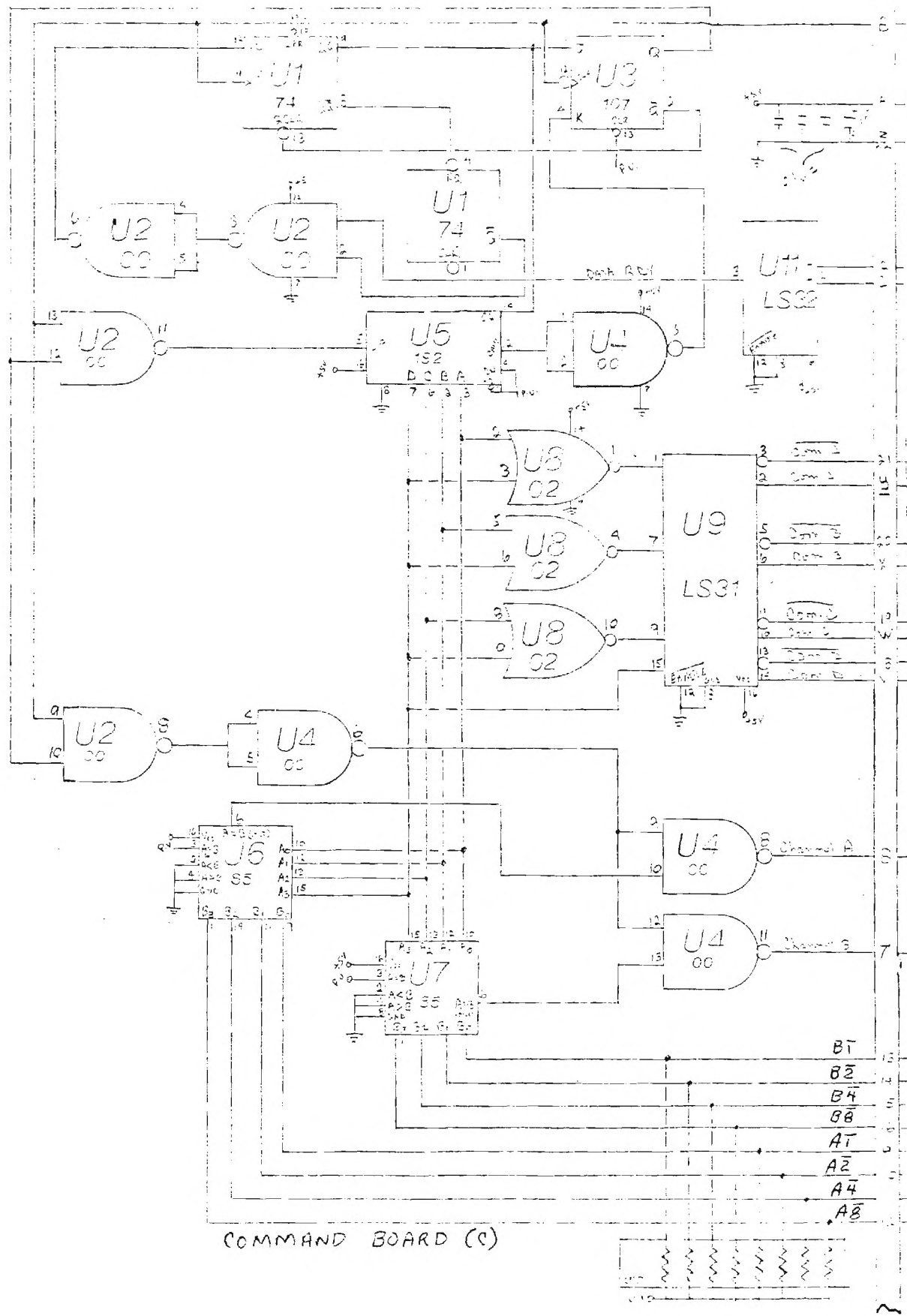


JB

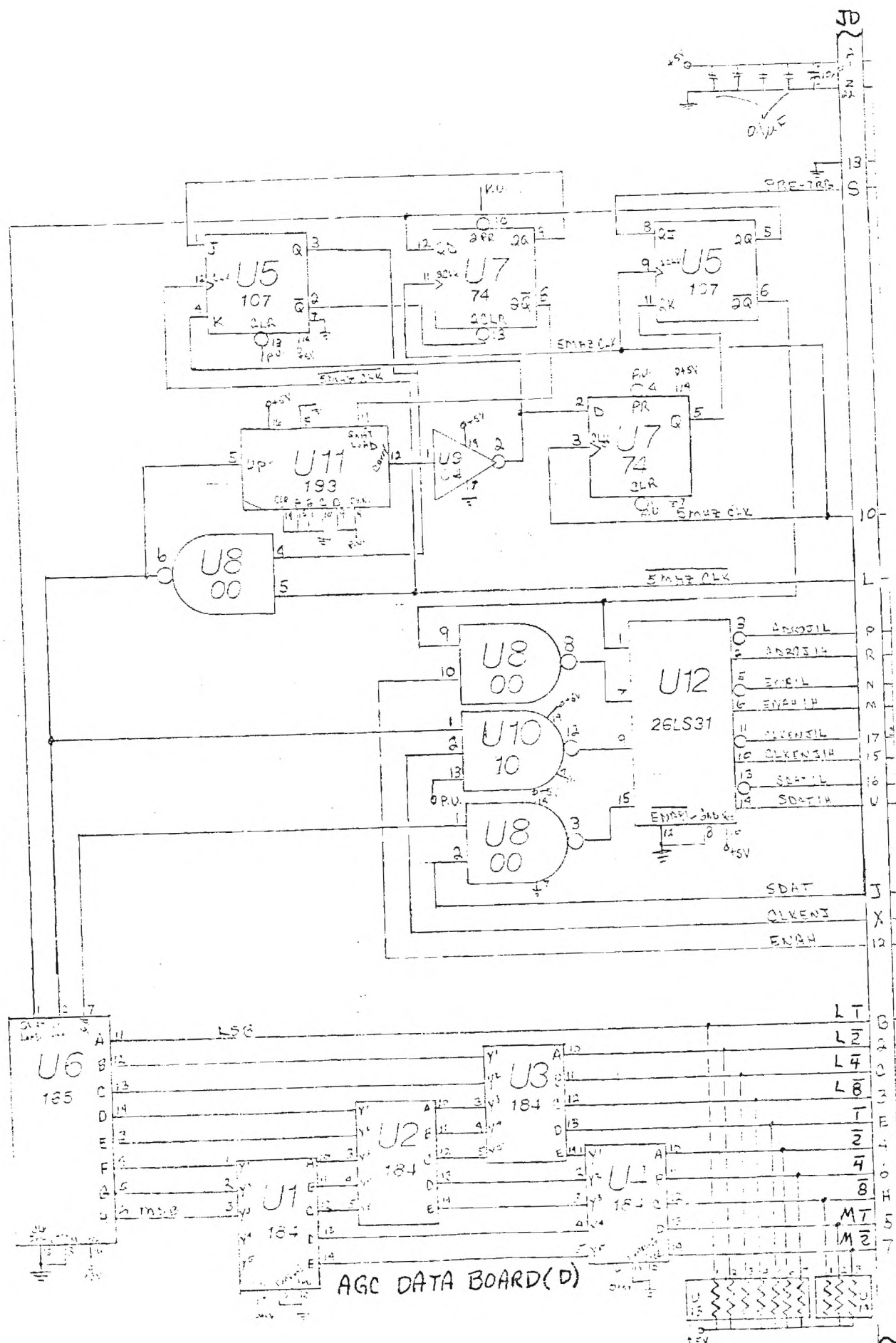


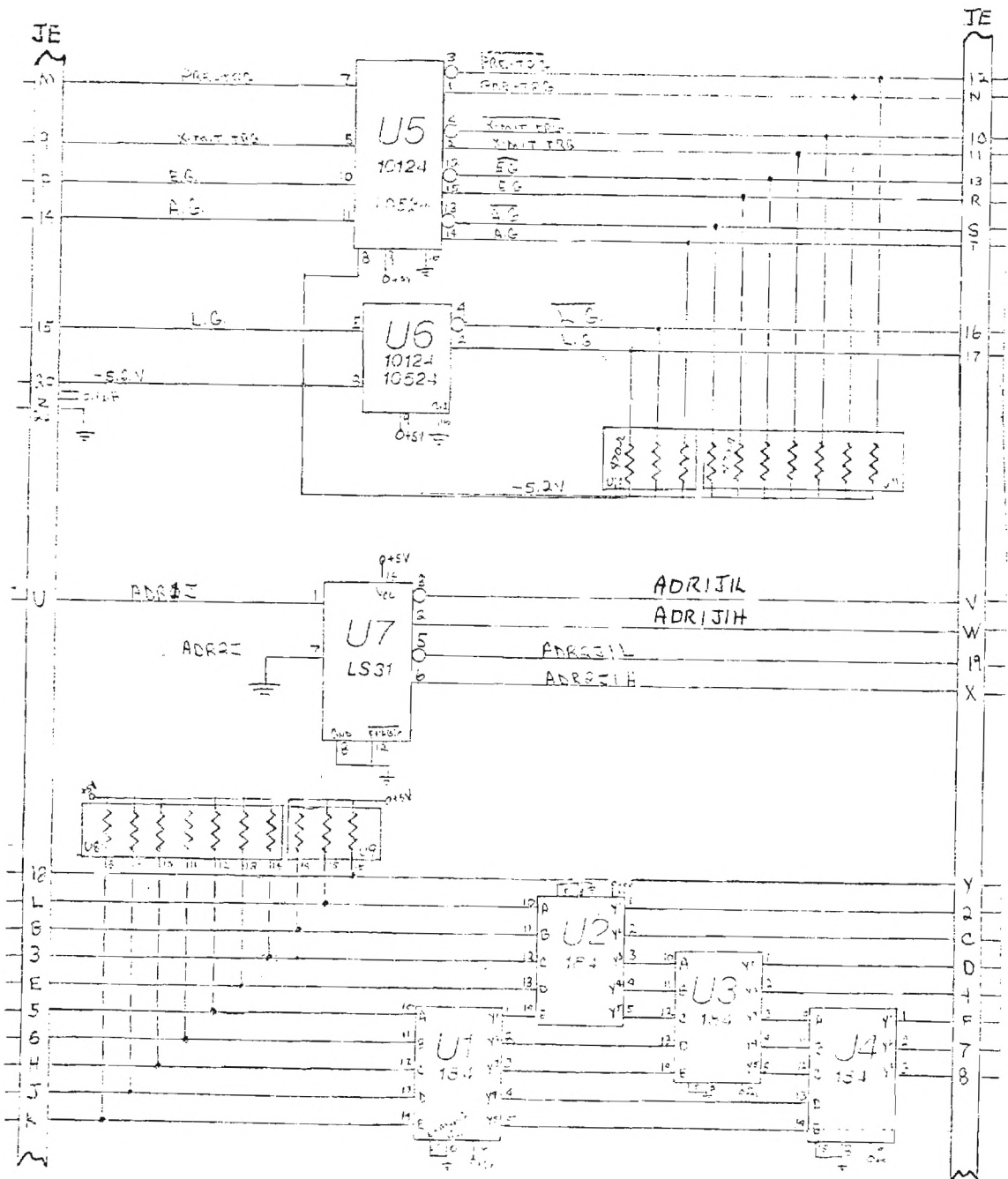
D/A BOARD (B)

JO  
~



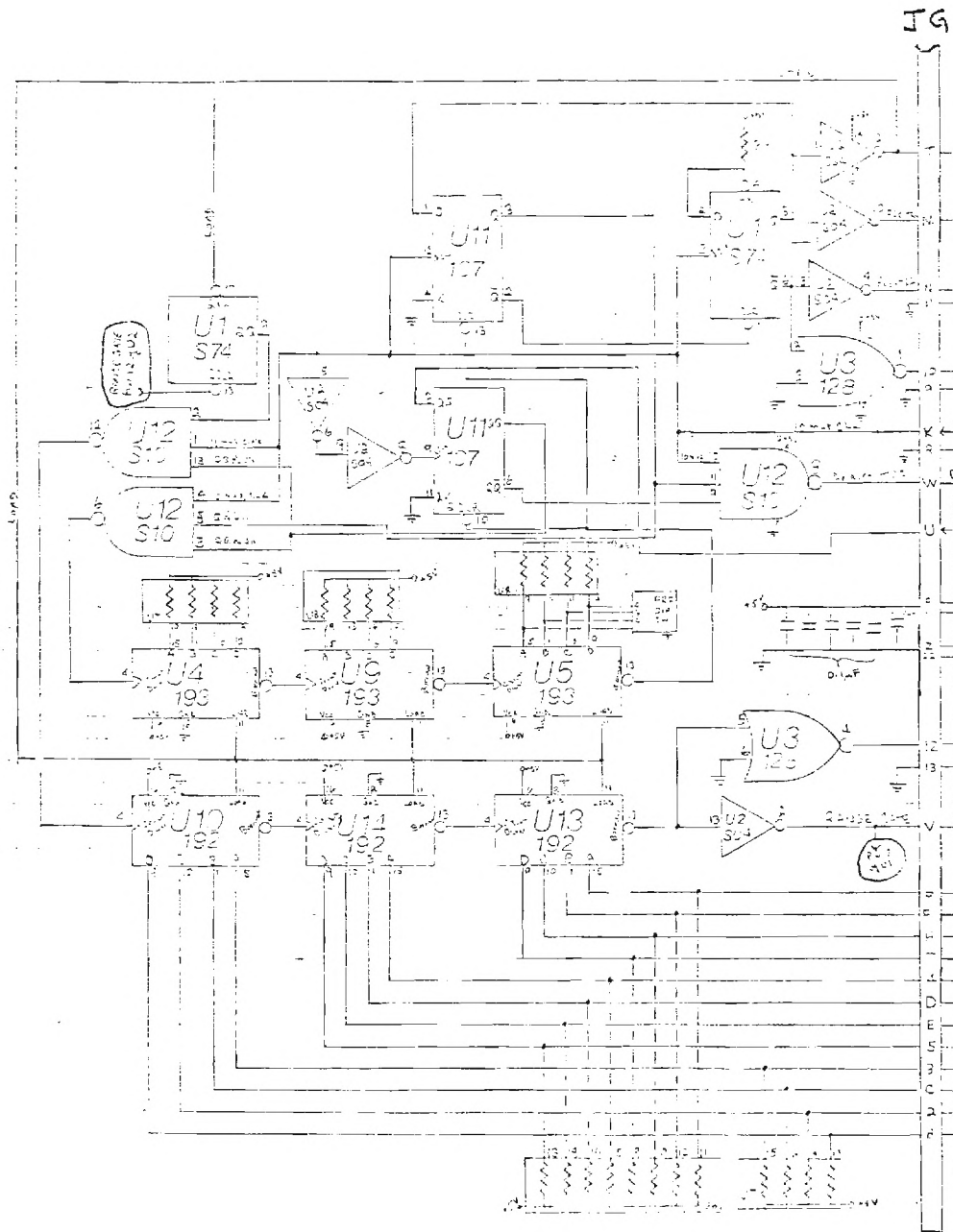
COMMAND BOARD (C)





DRIVER BOARD(E)





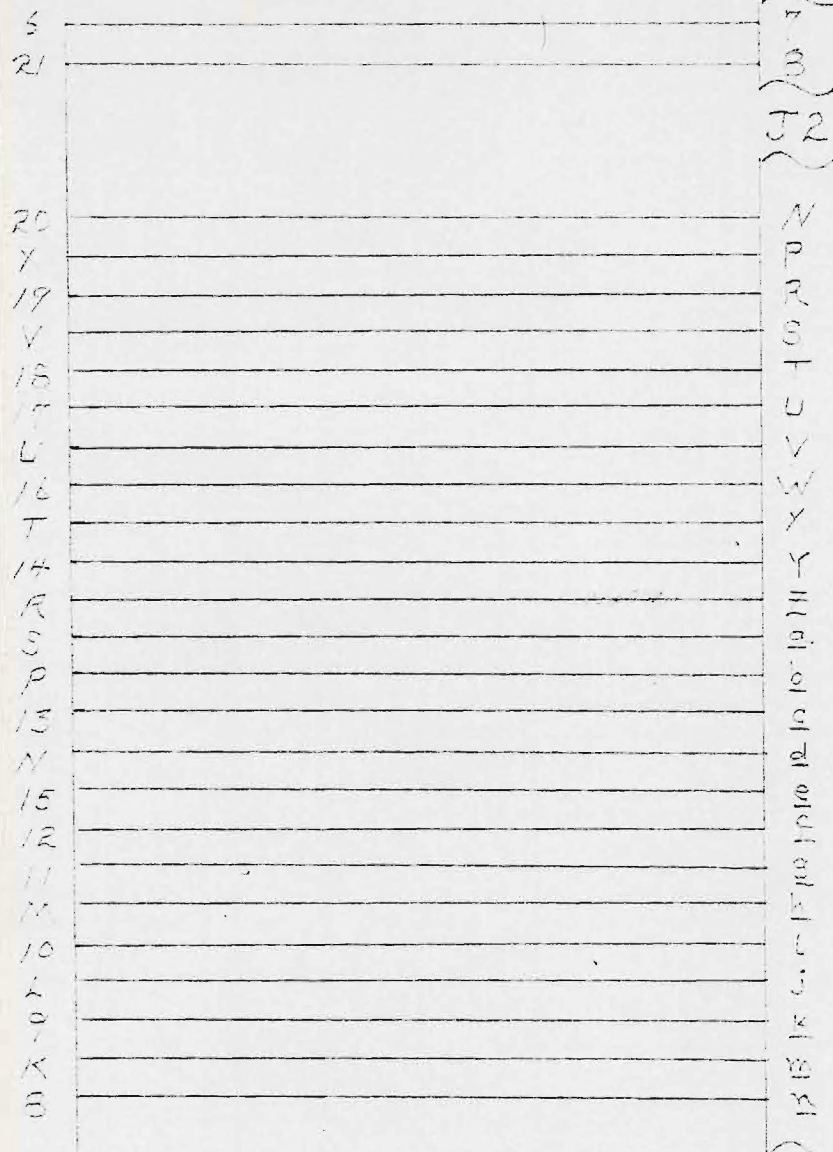
PRF & RANGE GATE BOARD (G)



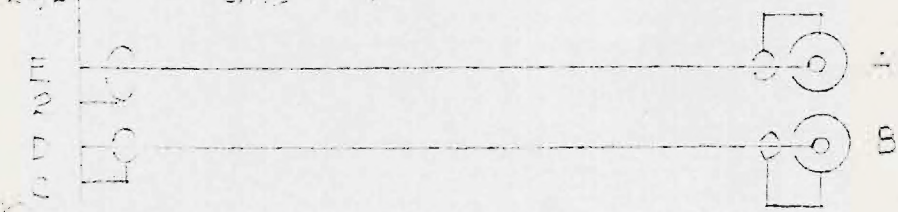
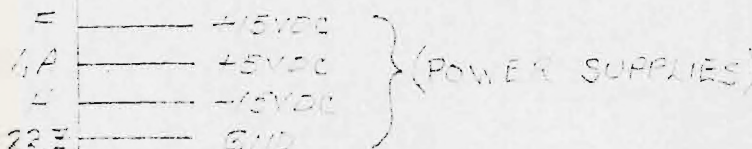


D/A BOARD

COMMAND BOARD



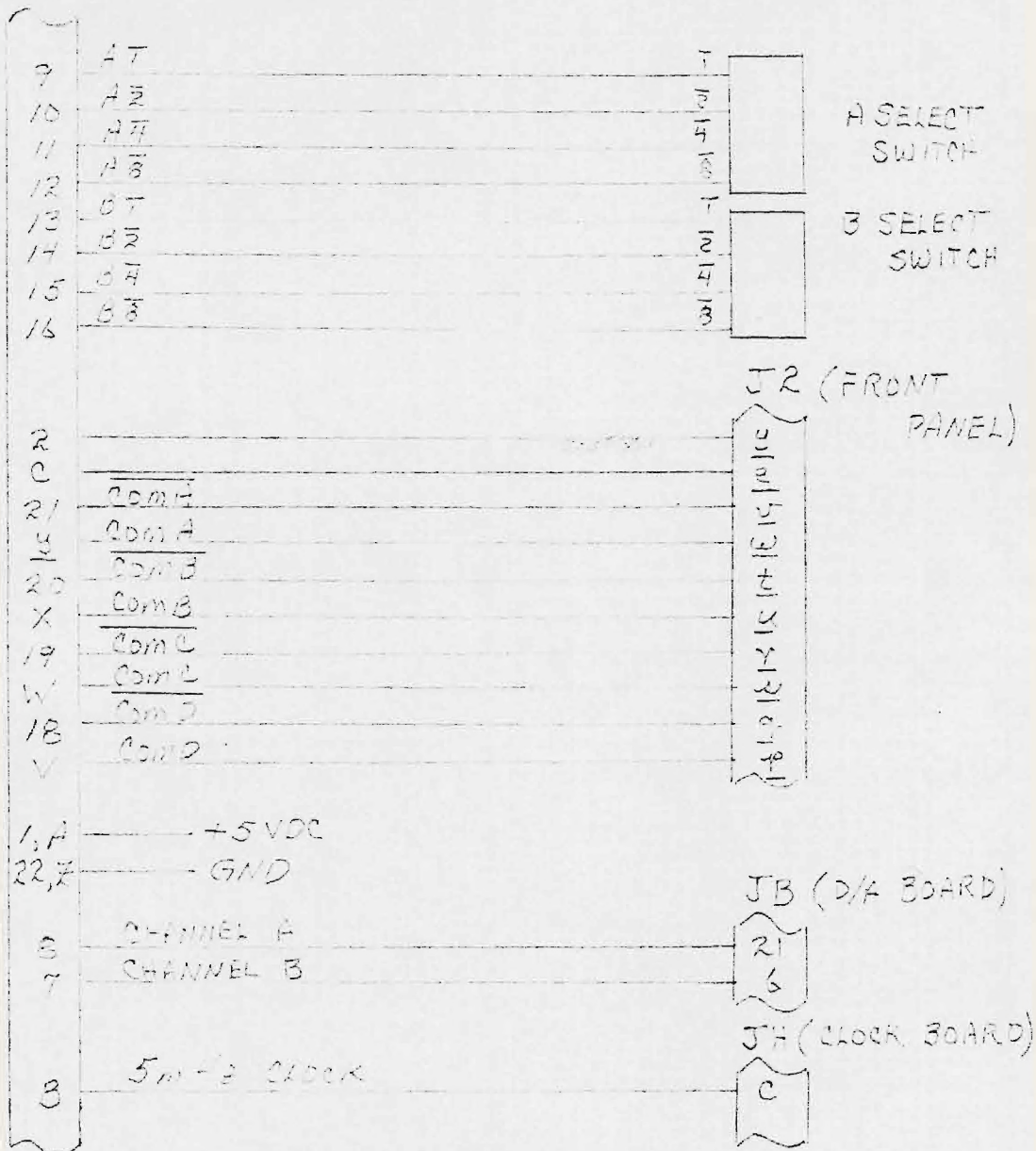
FRONT PANEL



FRONT PANEL

D/A BOARD CONNECTOR LIST

# JC (COMMAND BOARD)

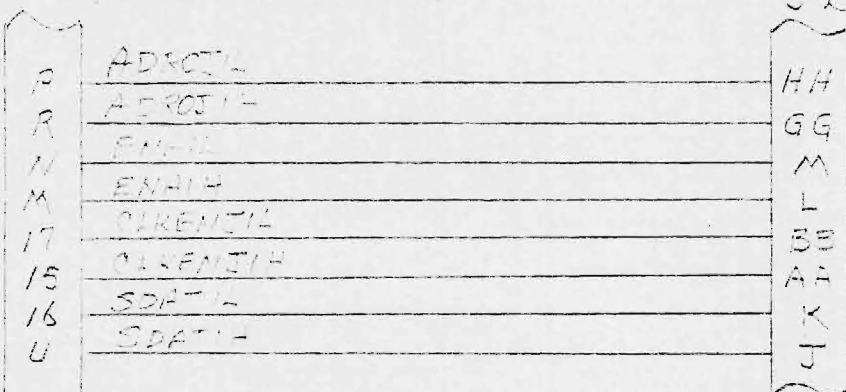


COMMAND BOARD CONNECTOR LIST

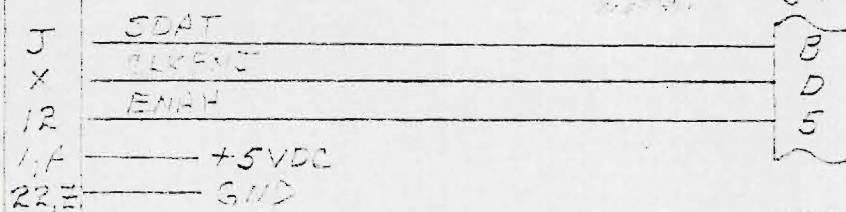


# JD (AGC DATA BOARD)

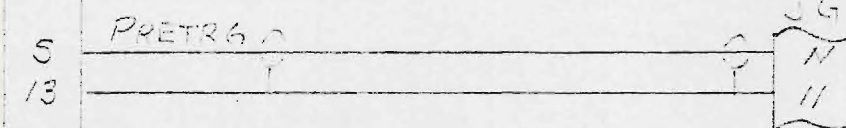
## J2 (FRONT PANEL)



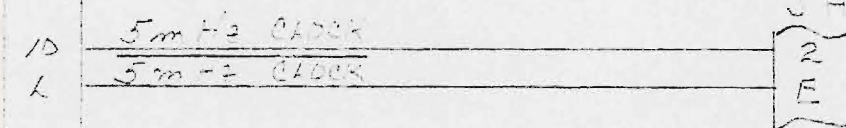
## JF (RF ATTEM BOARD)



## JG (PRF & RANGE GATE BOARD)



## JH (CLOCK BOARD)

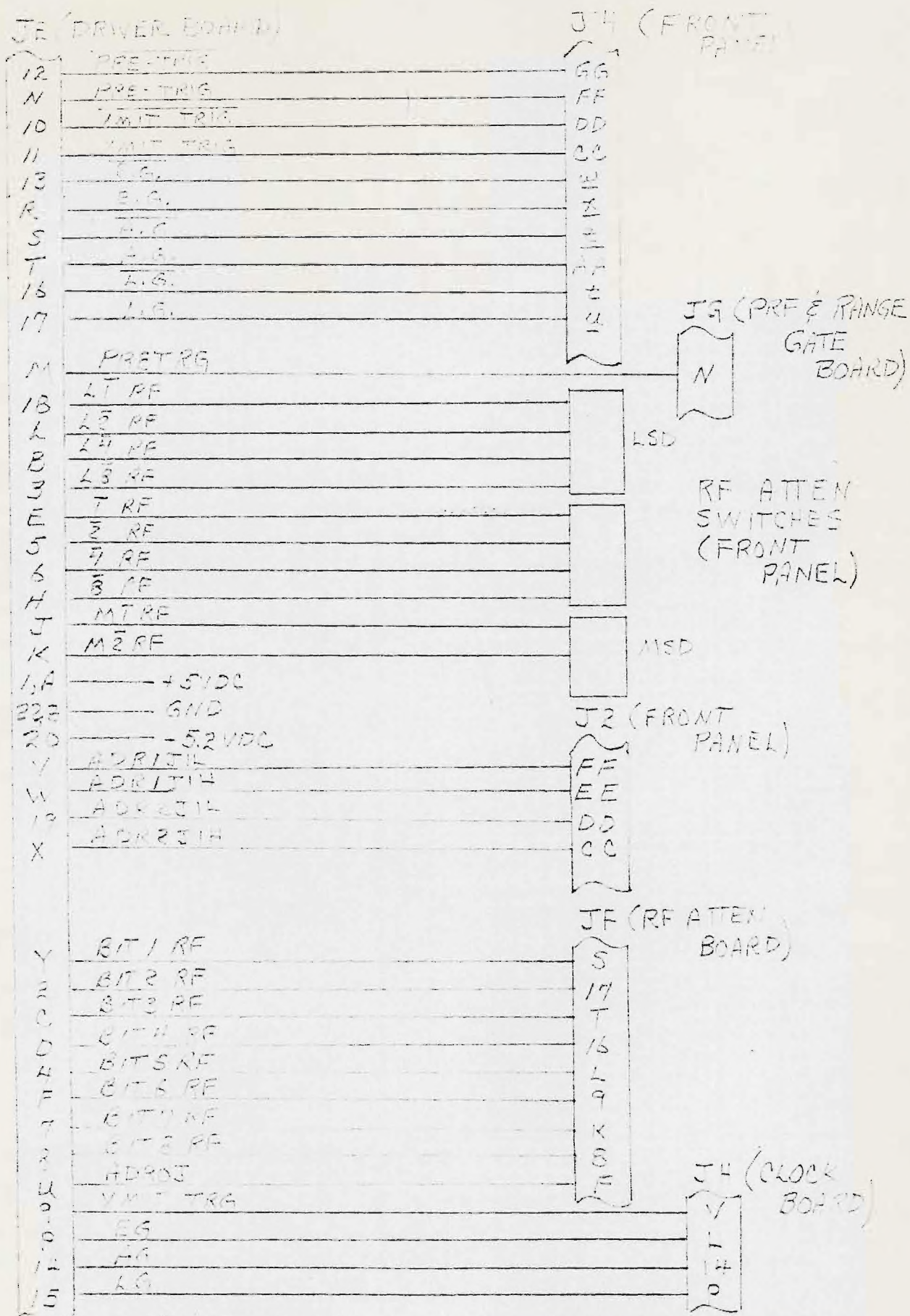


## LSD AGC SET SWITCHES



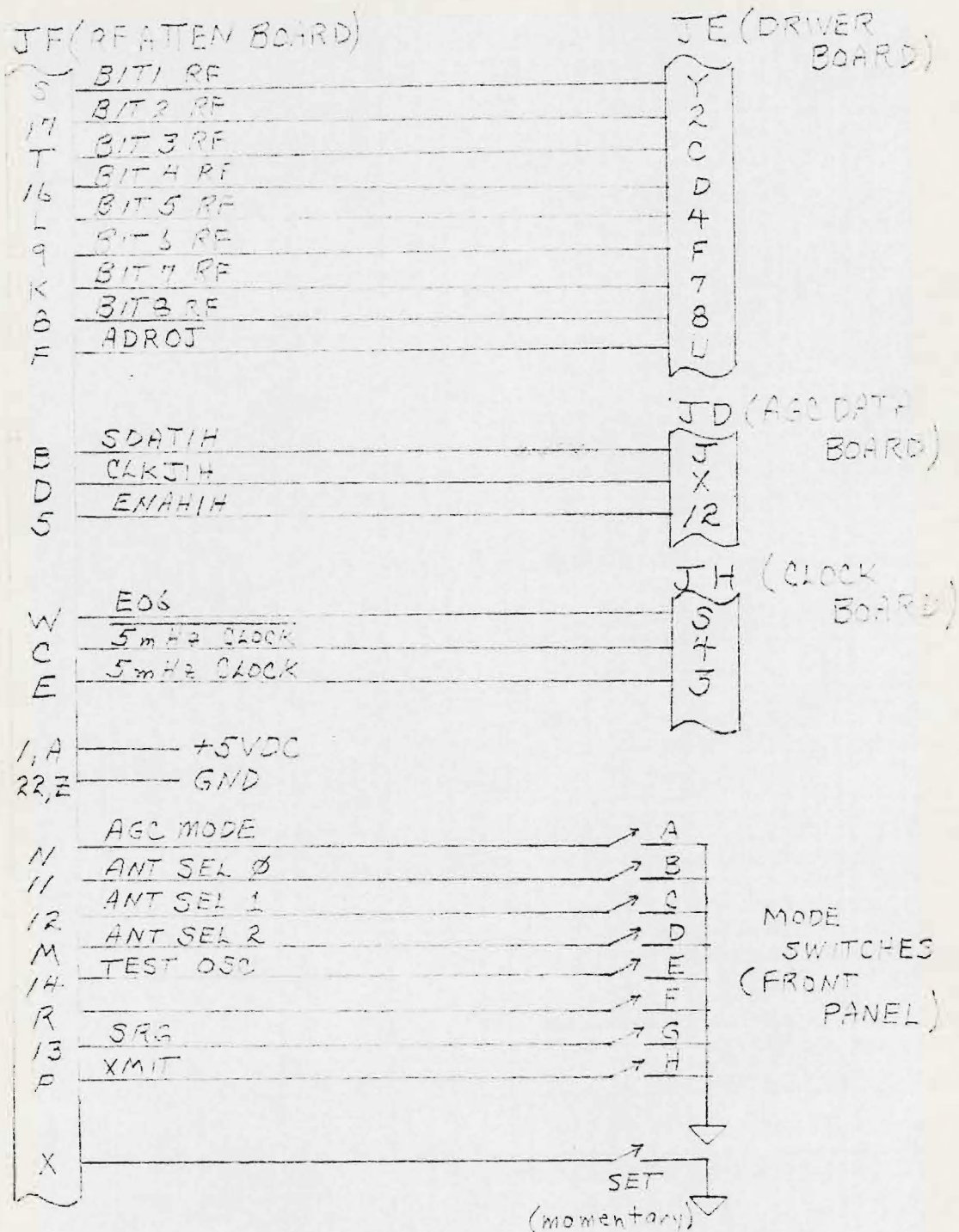
## MSD

### AGC DATA BOARD CONNECTOR LIST



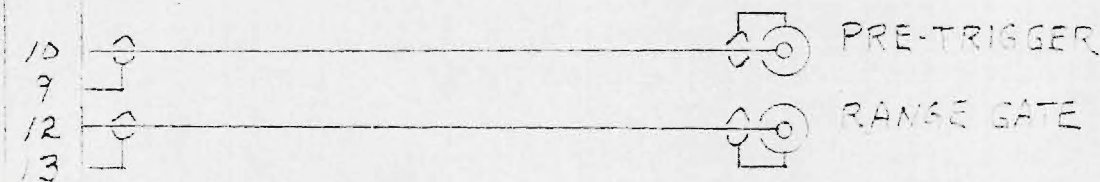
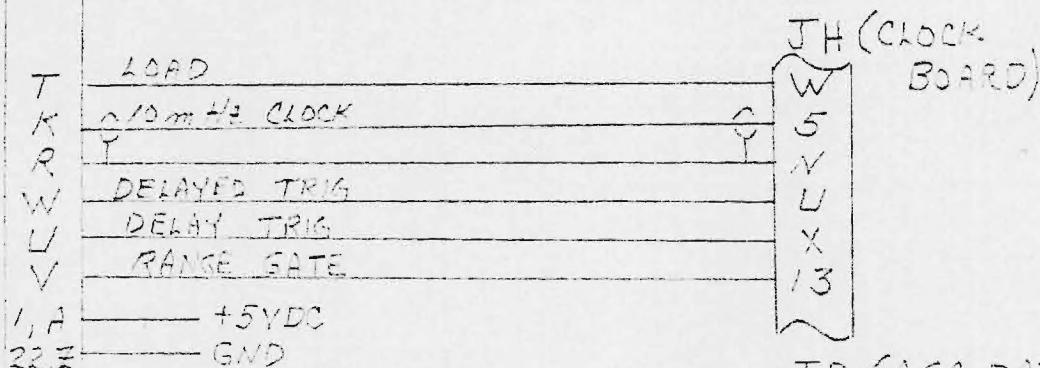
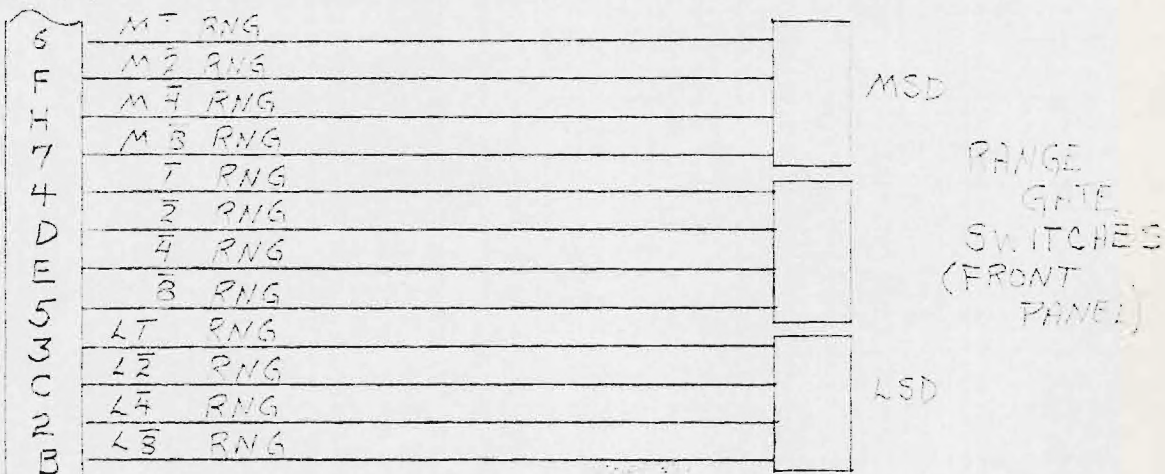
DRIVER BOARD CONNECTOR LIST





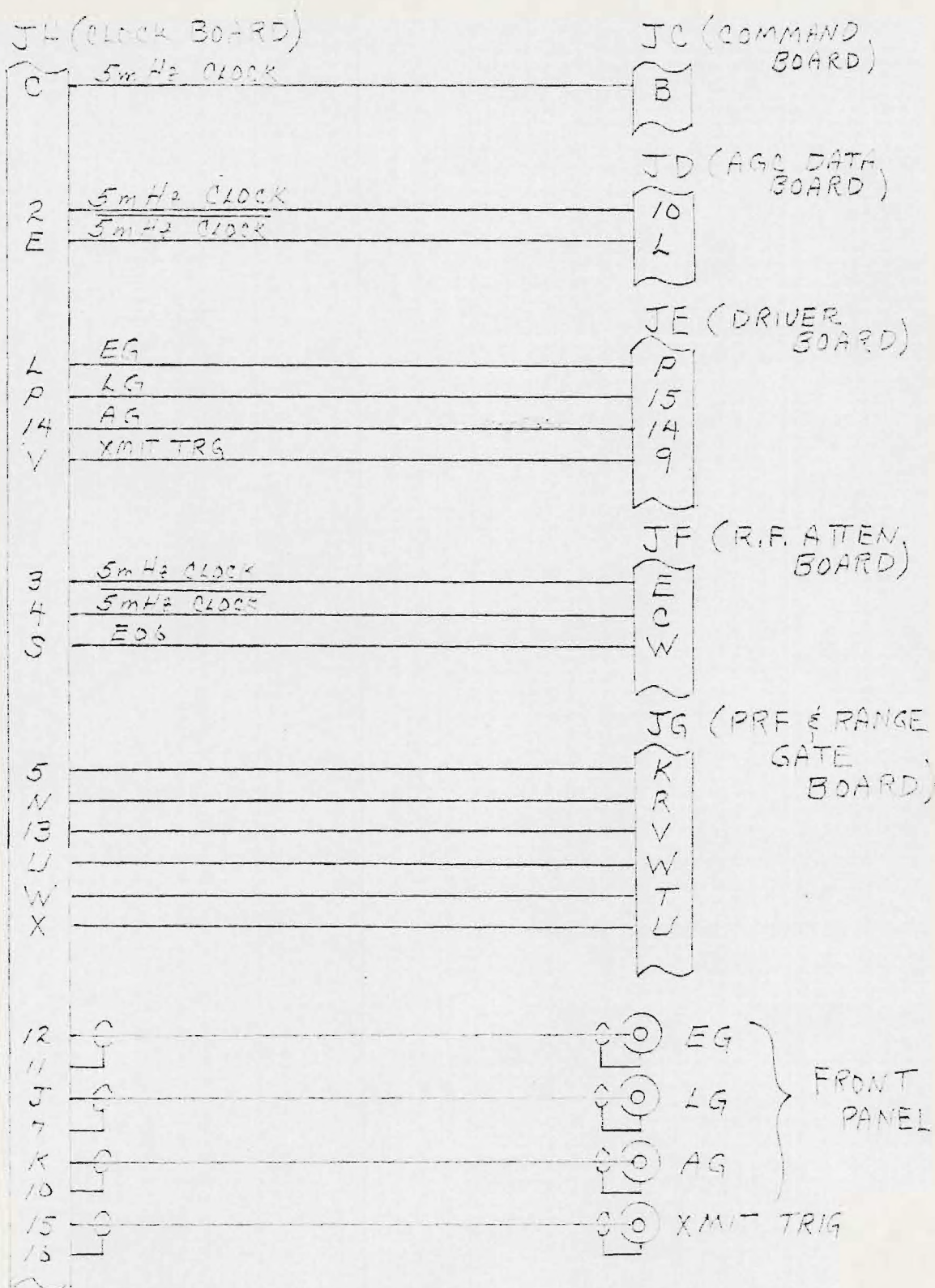
RF ATTENUATOR BOARD CONNECTOR LIST

# JG (PRF & RANGE GATE BOARD)



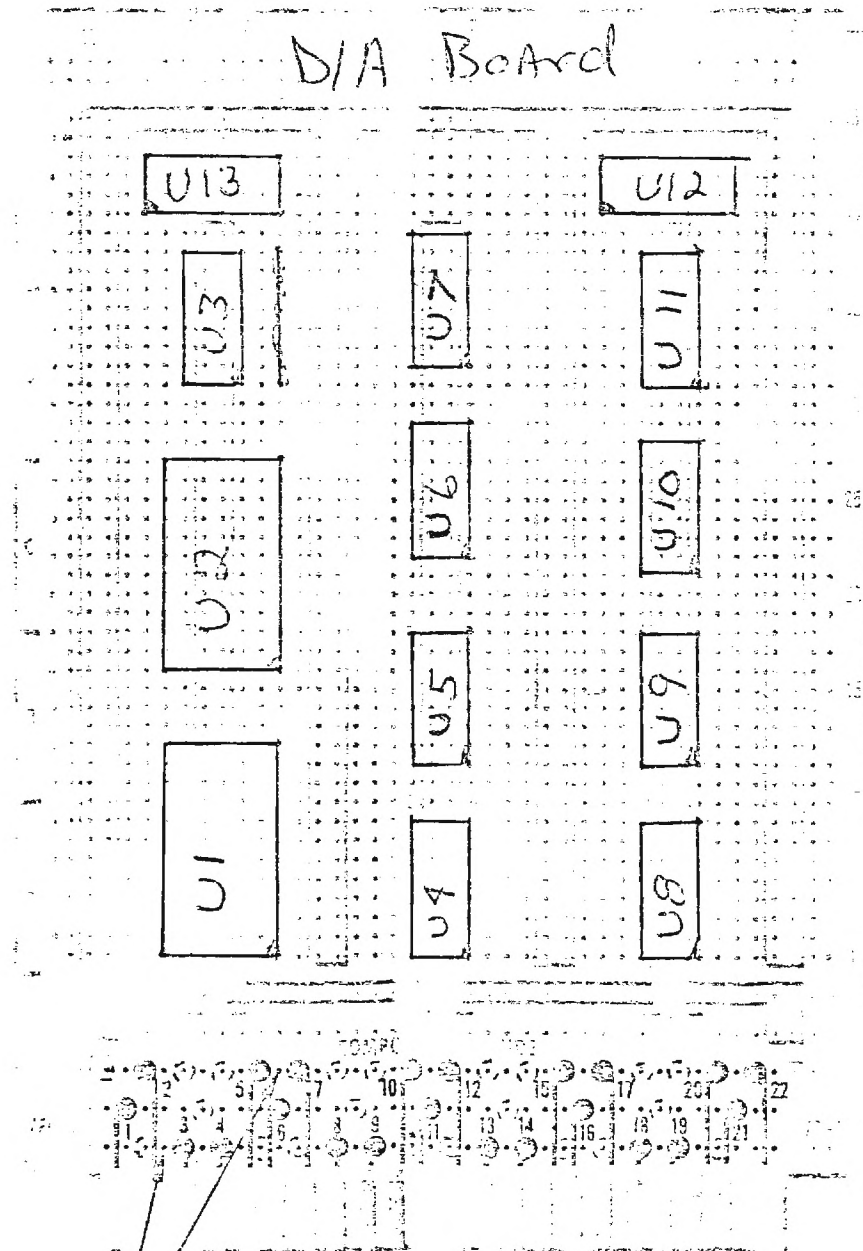
PRF & RANGE GATE BOARD CONNECTOR LIST



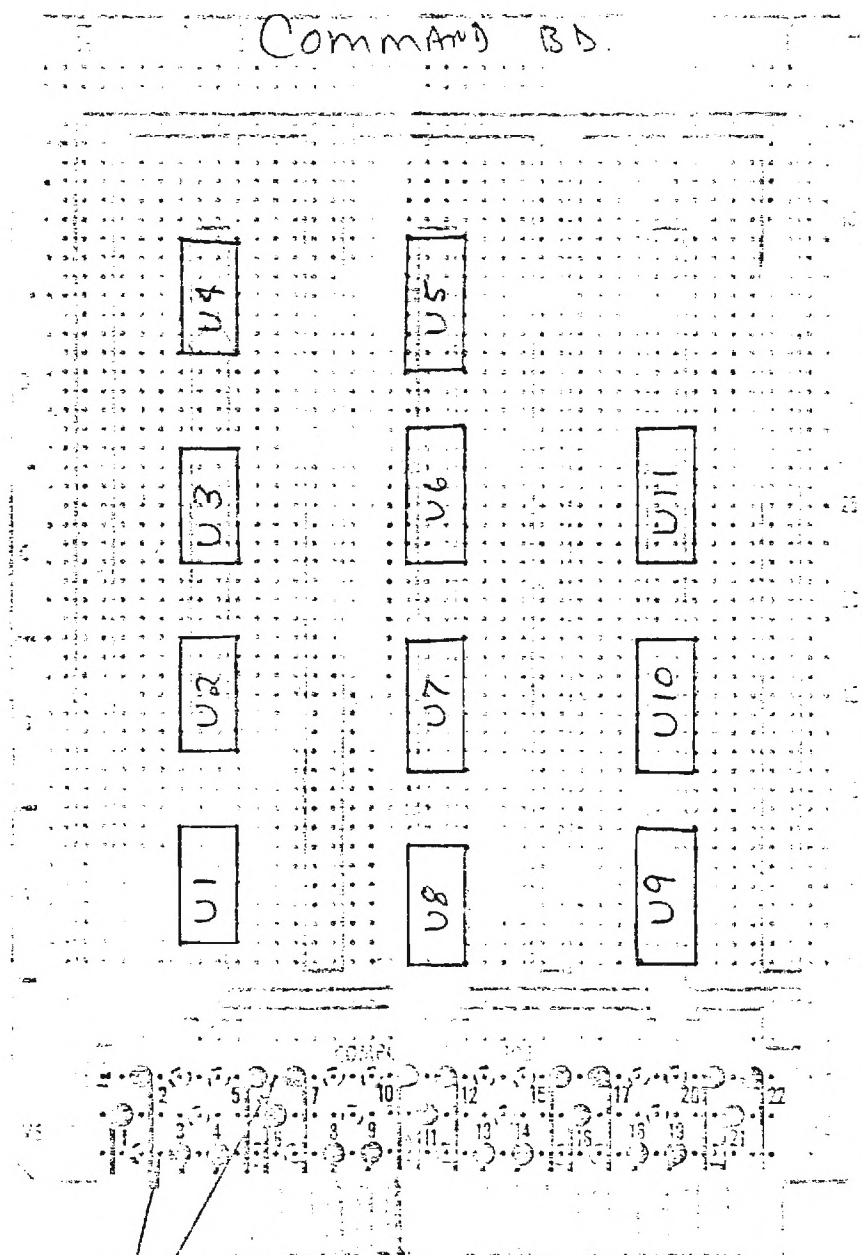


CLOCK BOARD CONNECTOR LIST

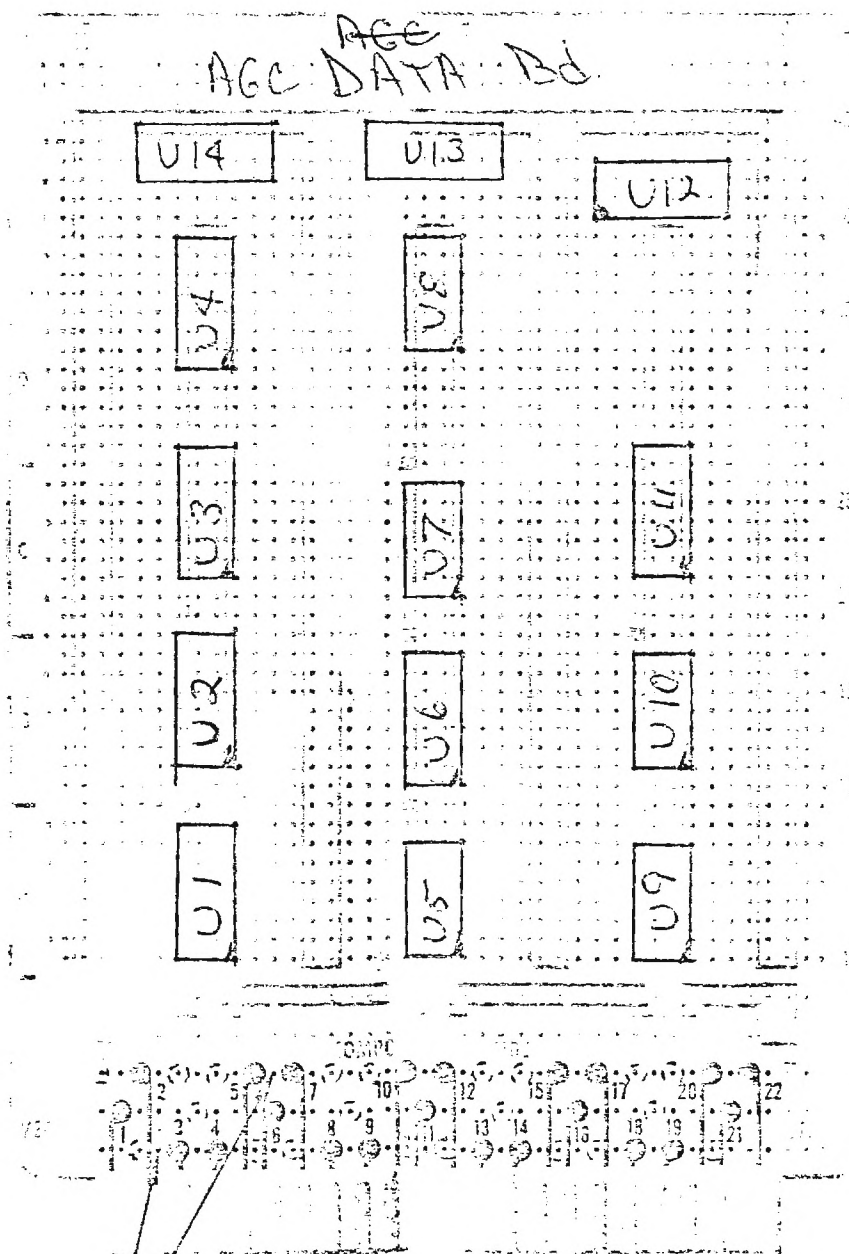




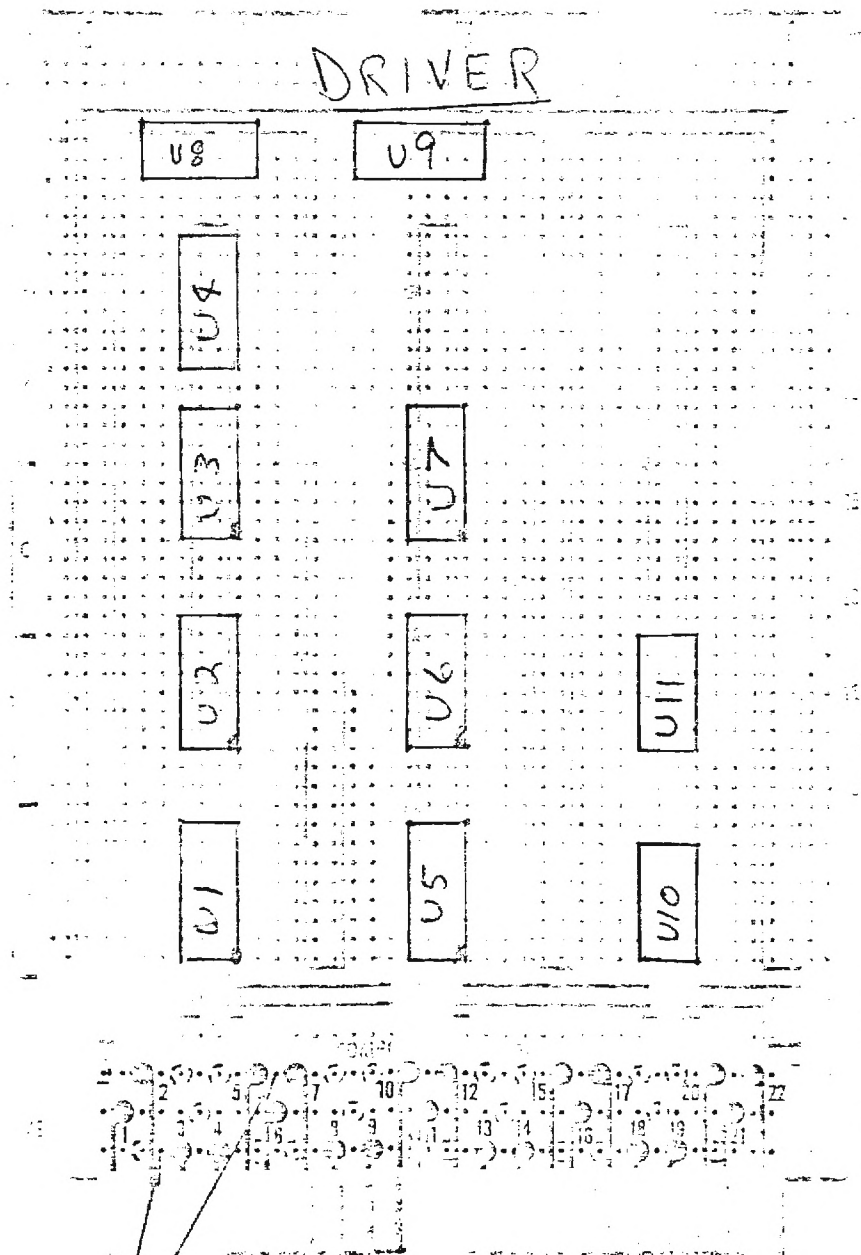
D/A BOARD (B) LAYOUT



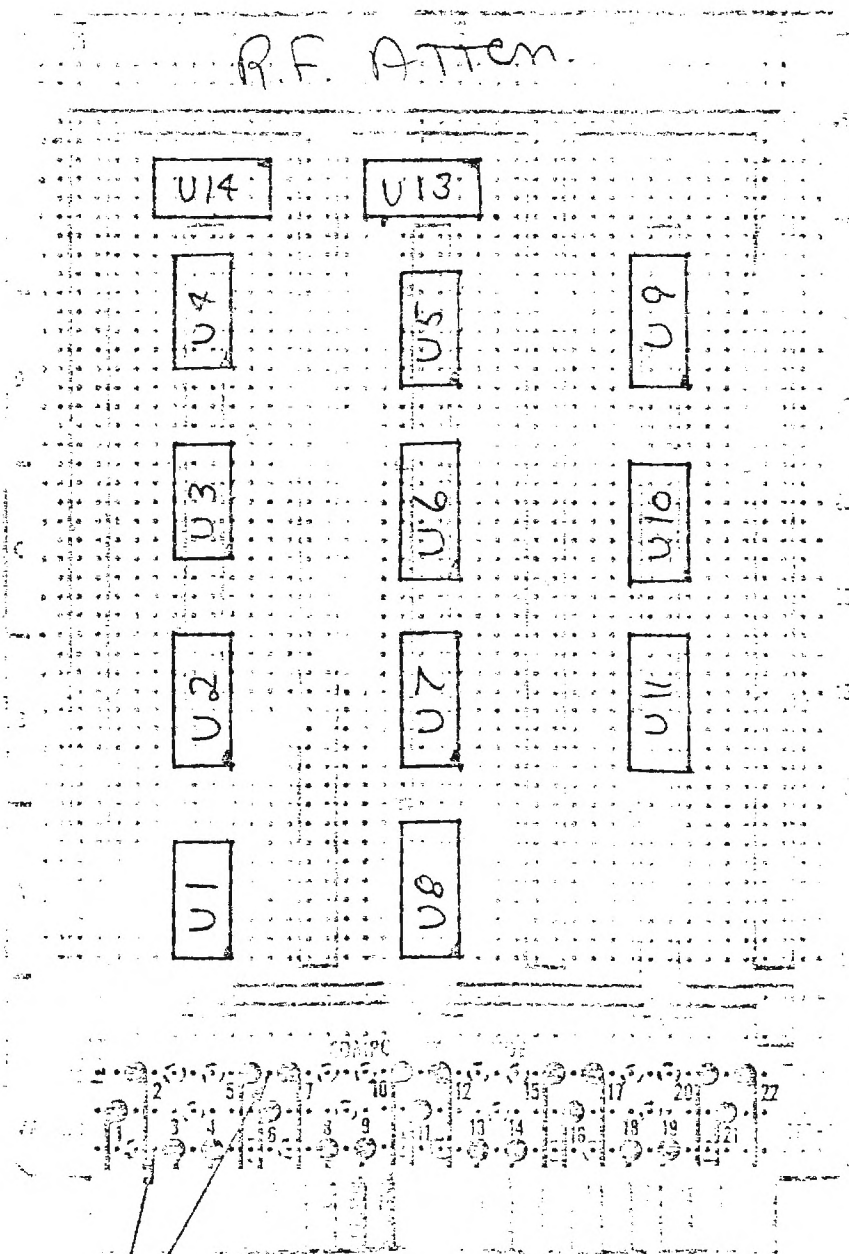
COMMAND BOARD (C) LAYOUT



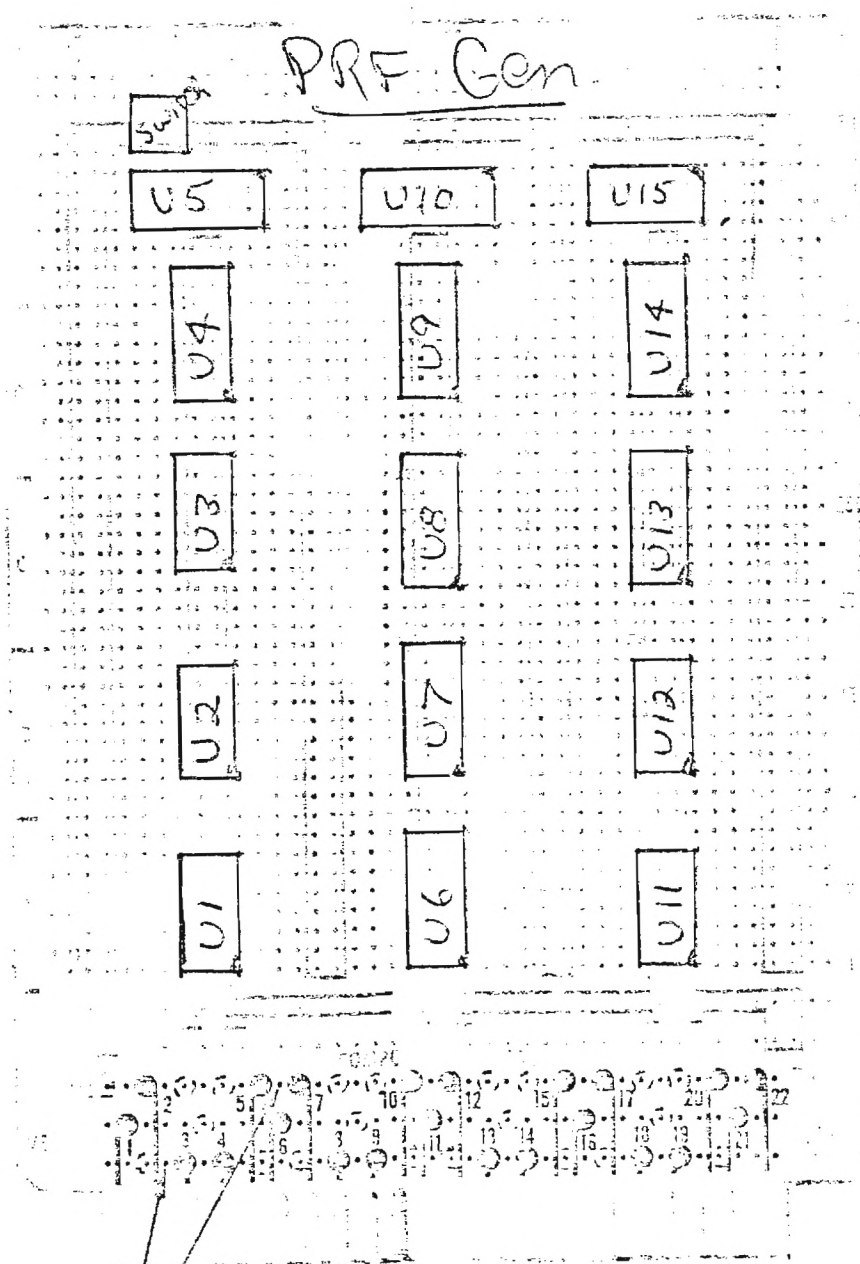
AGE DATA E ARE (D) LAYOUT



DRIVER BOARD (E) LAYOUT

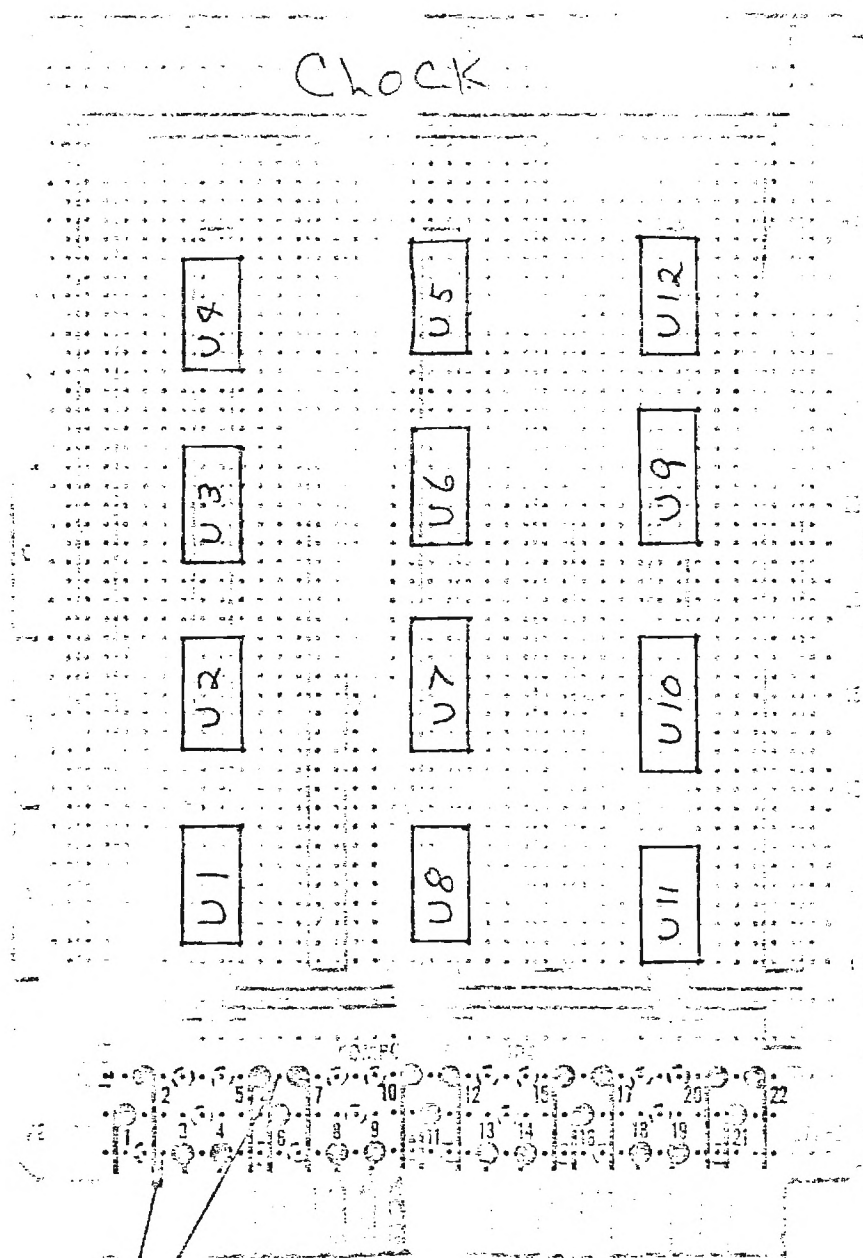


RF ATTENUATOR BOARD(F) LAYOUT



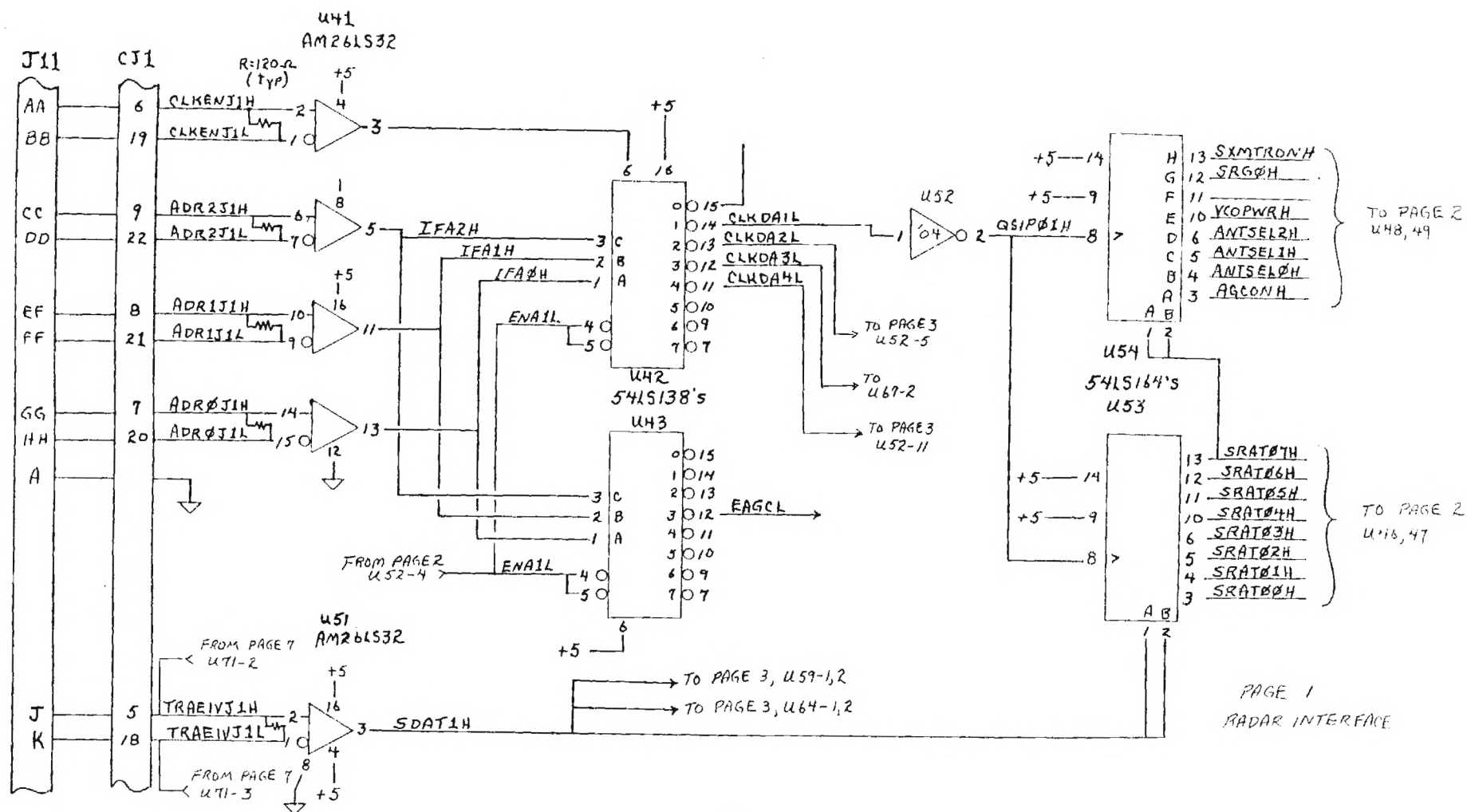
PRF GENERATOR BOARD (G) LAYOUT

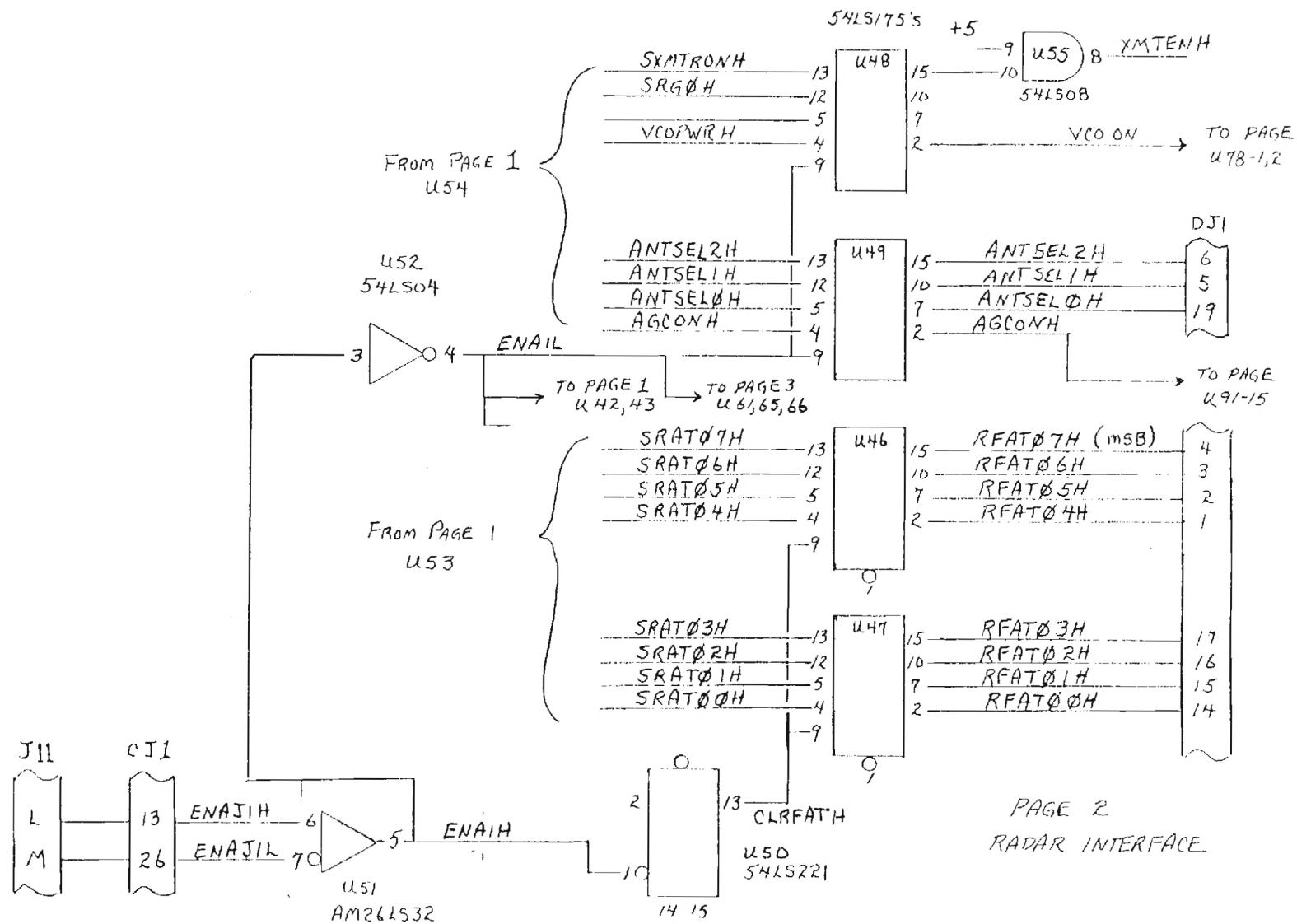
Schematic Diagram  
Radar Interface Board

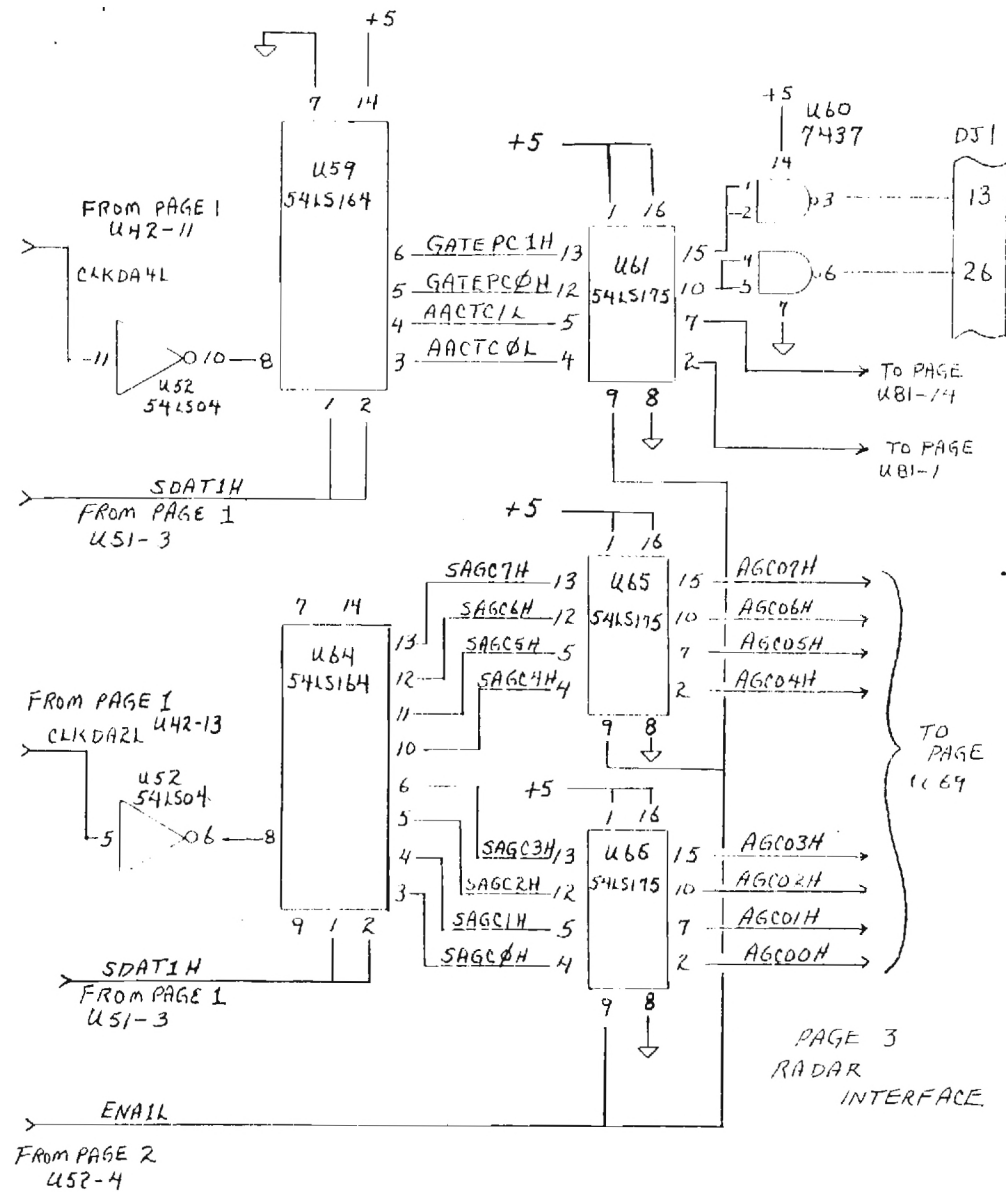


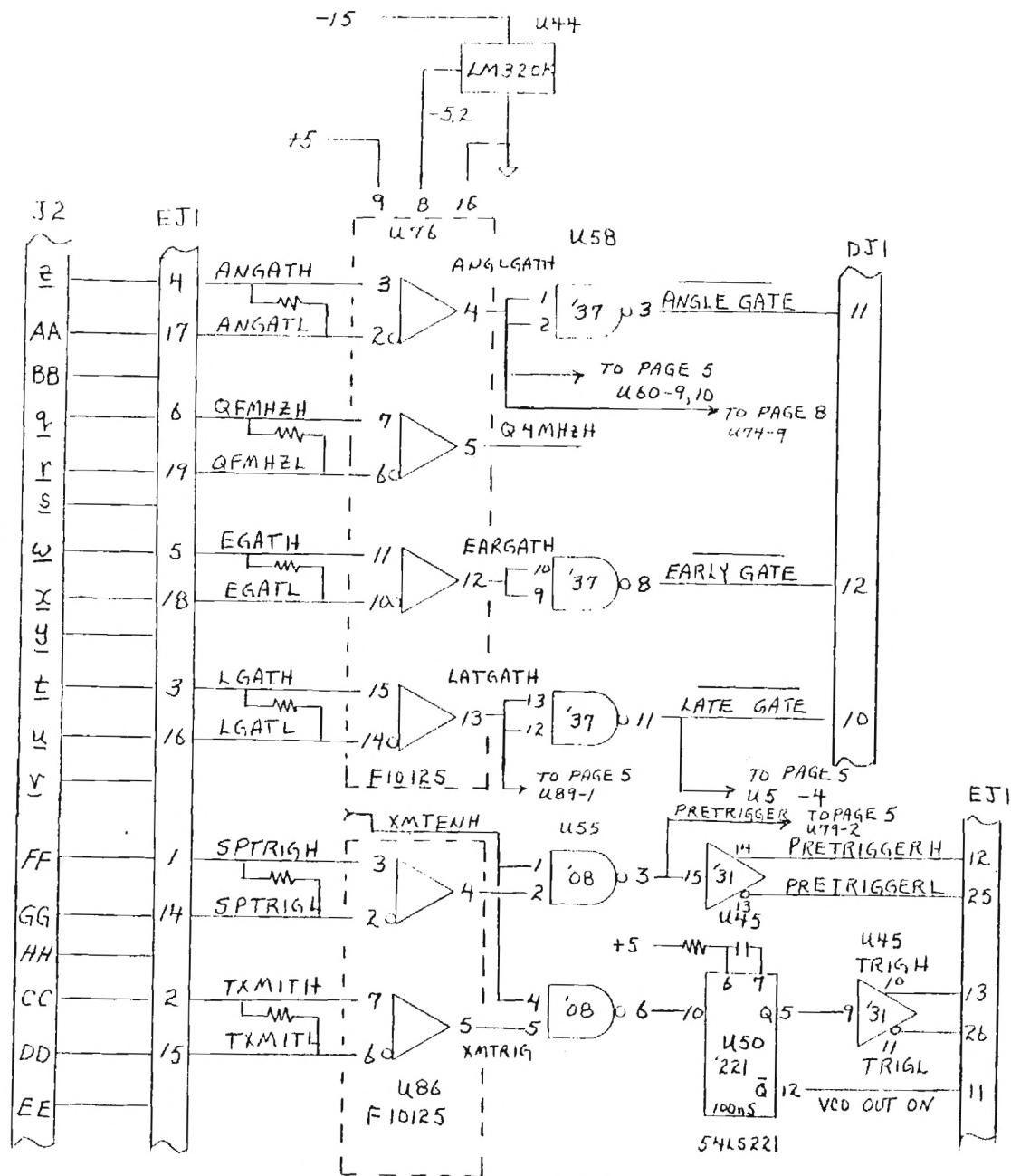
CLOCK BOARD (H) LAYOUT



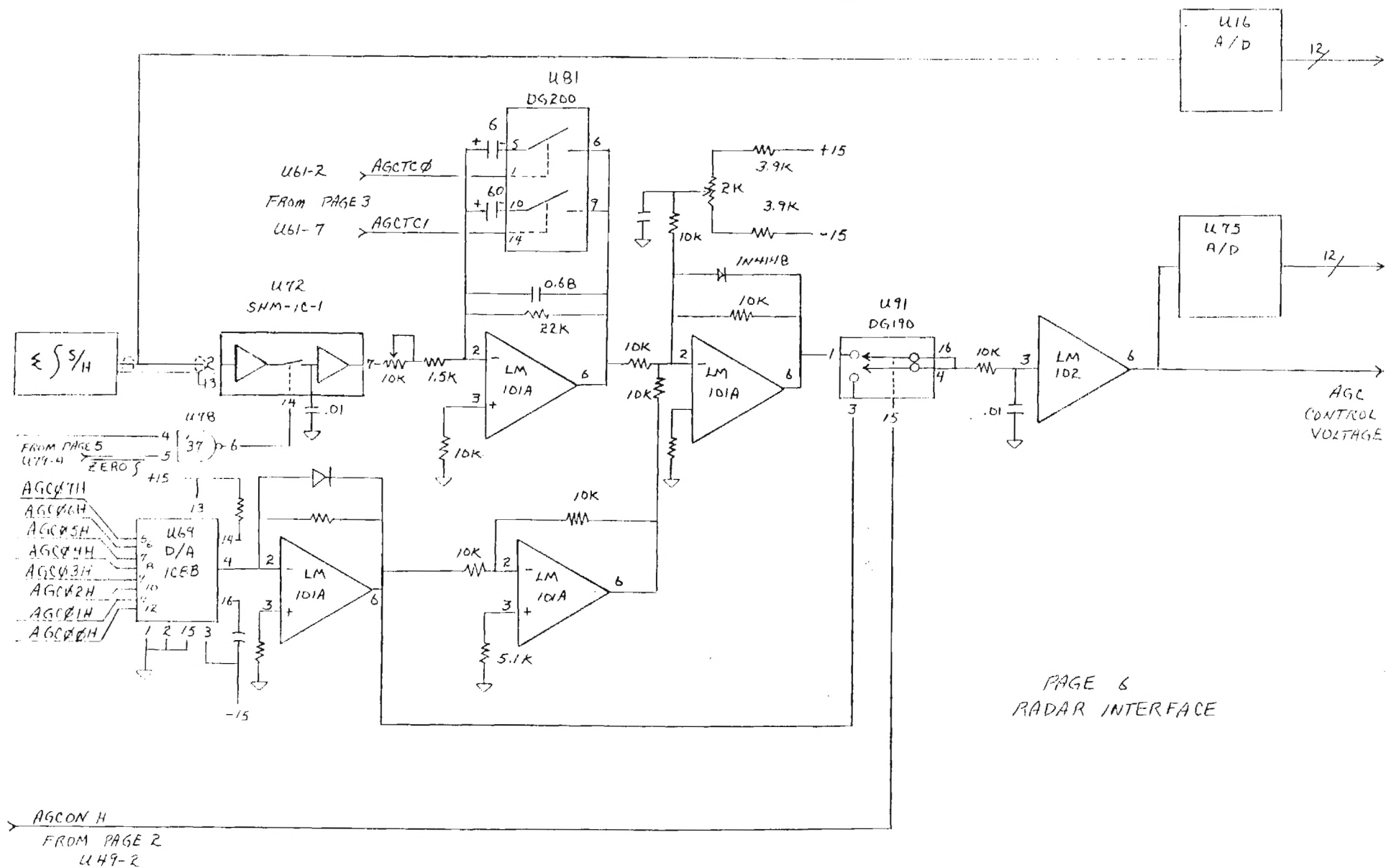




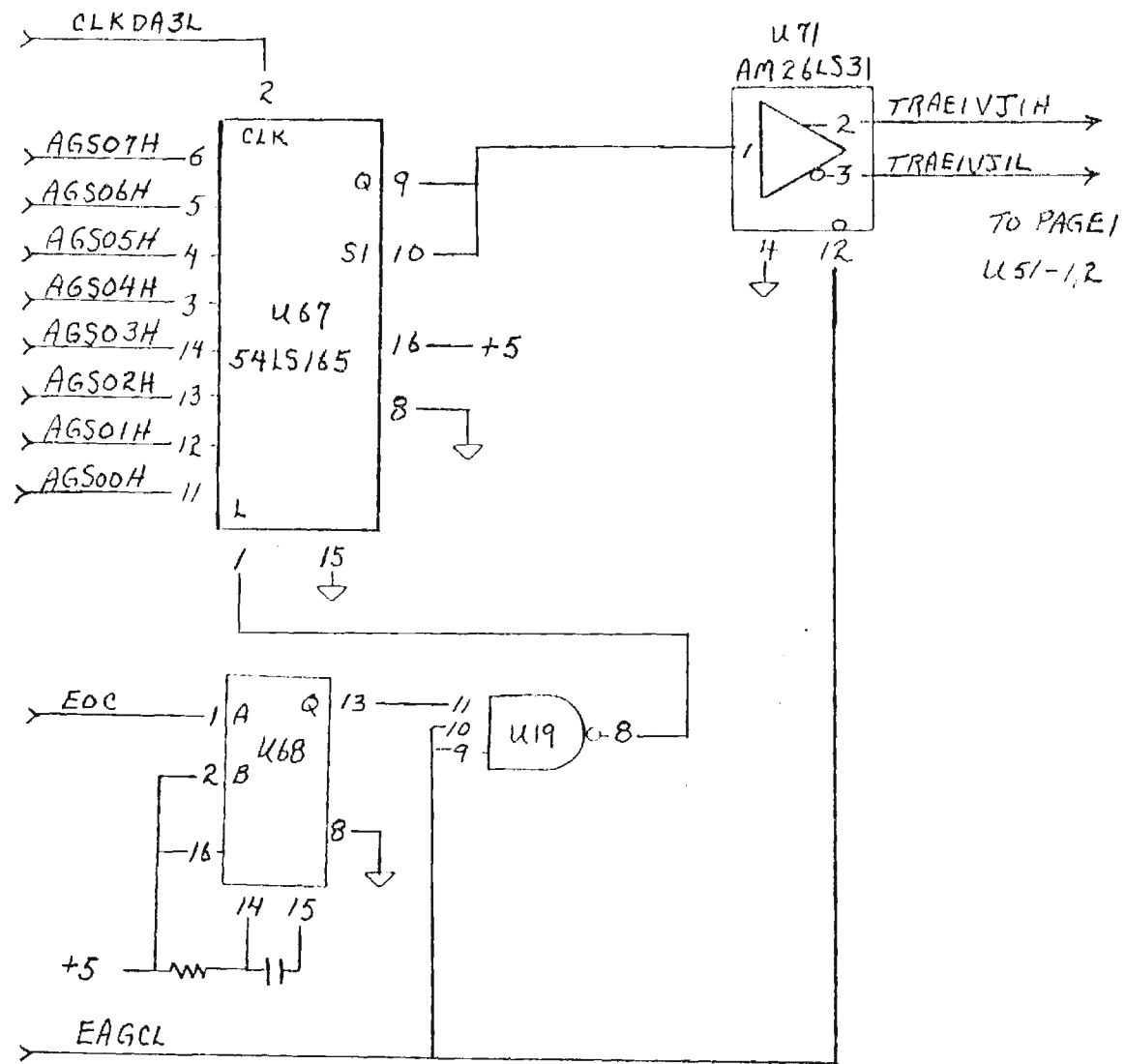




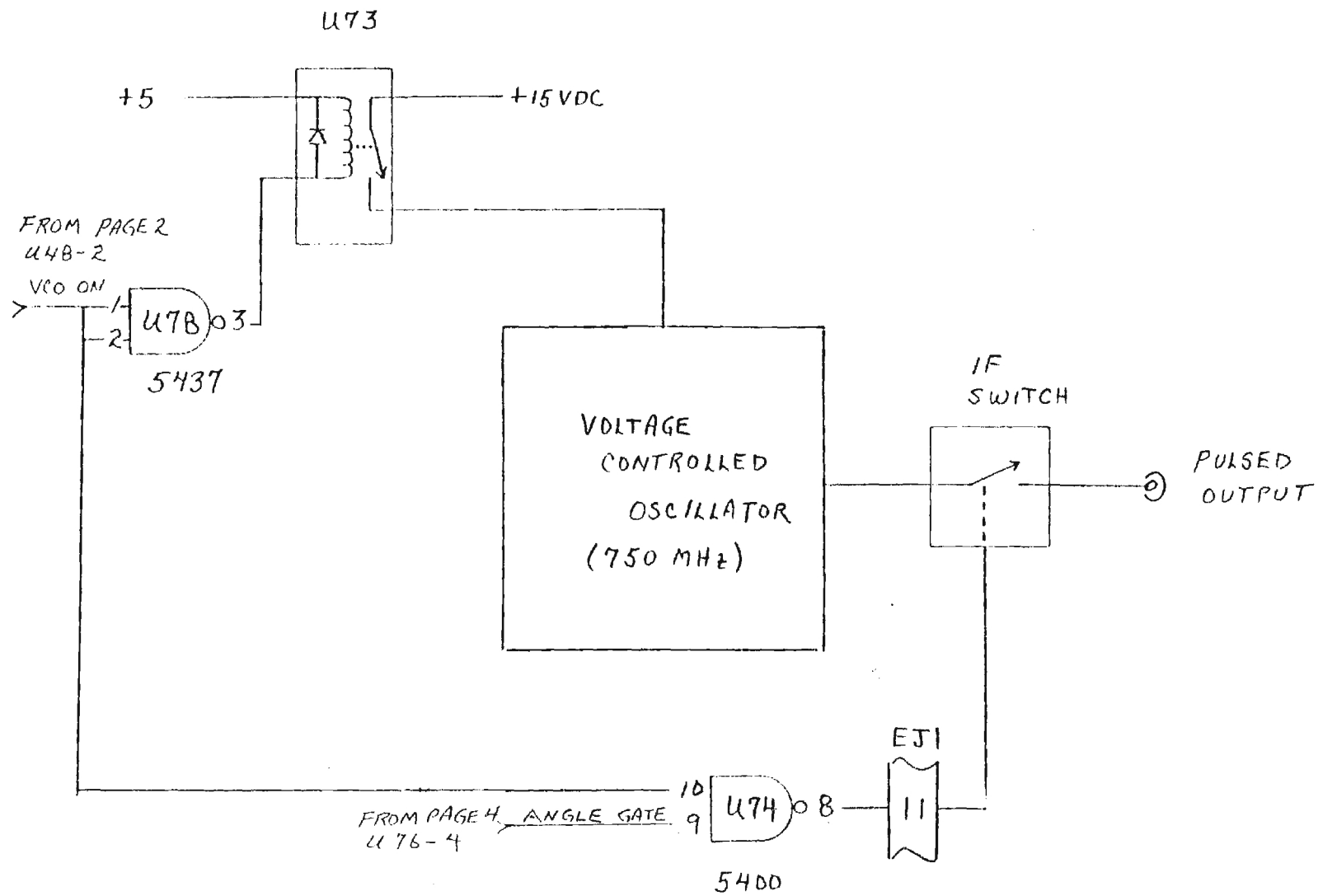




PAGE 6  
 RADAR INTERFACE



PAGE 7  
RADAR INTERFACE



PAGE 8  
RADAR INTERFACE BOARD